AMENDMENTS TO THE CLAIMS

This Listing of the Claims replaces all prior versions, and listings, of claims in this application.

Listing of the Claims:

1. (Previously Presented) A digital data system comprising

a plurality of nodes interconnected by at least one link,

the nodes being configured to communicate message packets on the link, each message packet having a format and a plurality of symbols that are transmitted by a first node on the link and received by a second node on the link, wherein the message packet is aligned in relation to a frame signal,

at least one of said first and said second nodes being configured to communicate a link level control symbol,

the link level control symbol being interposed between symbols of a message packet as an additional symbol to signal an adjacent node on the link,

such that the adjacent node receives the additional symbol before completion of the message packet to effect a link level control of message flow on the link.

2. (Original) A digital data system according to claim 1, wherein said additional symbol is asserted with a marker whereby the adjacent node detects the control symbol within the message packet to effect said link level control of message flow.

3. (Original) A digital data system according to claim 1, wherein at least one node includes at least one of

(i) an input buffer that at least temporarily stores a received message, and

(ii) an output buffer that at least temporarily stores a message for transmission,

and the control symbol effects a link level control to prevent buffer overflow.

4. (Previously Presented) A digital data system according to claim 1, wherein a message includes an error code for detecting corruption of a received message, and a receiving node that receives two portions of a message packet surrounding a control symbol realigns the received portions to apply the error code to the two portions of the message packet surrounding the control symbol.

5. (Previously Presented) A digital data system according to claim 1, wherein the control symbol instructs a receiving node to reduce its message transmission rate.

6. (Previously Presented) A digital data system according to claim 1, wherein the control symbol includes a control code for identifying one of

i) a faulty message transmission, and

ii) a faulty message reception.

7. (Previously Presented) A digital data system according to claim 1, wherein the link is bi-directional, and interconnects the first node at one end of the link with the second node at another end of the link, said first and second nodes being full duplex nodes.

8. (Previously Presented) A digital data system according to claim 4, where in the control symbol instructs the adjacent node to reduce its message transmission rate by transmitting a specified number of idle states so as to match receiver capacity to transmission rate.

9. (Previously Presented) A digital data system comprising

a plurality of nodes interconnected by at least one link,

the nodes being configured to communicate message packets on the link, each message packet having a format and a plurality of symbols that are transmitted by a first node on the link and received by a second node on the link, wherein the message packet is aligned in relation to a frame signal,

at least one of said first and said second nodes being configured to communicate a link level control symbol,

the link level control symbol being interposed between symbols of a message packet as an additional symbol to signal an adjacent node on the link,

such that the adjacent node receives the additional symbol before completion of the message packet to effect a link level control of message flow on the link

wherein said additional symbol is asserted with a marker whereby the adjacent node detects the control symbol within the message packet to effect said link level control of message flow

wherein a node transmits the interposed control symbol in alignment with a symbol boundary in a message packet, whereby received data may be passed through a register of fixed size and the control symbol is discerned via the marker, permitting alignment of portions of a message packet irrespective of interposition of the control symbol therebetween.

10. (Previously Presented) A digital data system according to claim 1, comprising a plurality of links forming an interconnect fabric among plural devices, the links interconnecting, and wherein each link has one node attached to one end of the link and another node

attached to another end of the link, the nodes cooperating to route messages along interconnected links between the devices of the system.

11. (Currently Amended) A digital data system comprising

a plurality of nodes interconnected by at least one link,

the nodes being configured to communicate message packets on the link between a first node on the link and a second node on the link, each message packet having a format and including a plurality of symbols, wherein the message packet is aligned in relation to a frame signal,

at least one of said first and said second nodes being configured to transmit a link level THROTTLE control symbol to the other of said first and said second nodes,

the link level THROTTLE control symbol being interposed between symbols of the message packet,

the link level THROTTLE control symbol being effective to induce the other of said first and said second nodes receiving said THROTTLE control symbol to

i) control message transmission of the other of said first and said second nodes receiving said THROTTLE control symbol

ii) controlling said transmission to space out transmission of data messages to regulate flow in said link between the other of said first and said second nodes receiving said THROTTLE control symbol and ~~the~~ one of said first and said second nodes transmitting said THROTTLE control symbol.

12. (Previously Presented) A digital data system according to claim 11, wherein the THROTTLE control symbol instructs the other of said first and said second nodes

receiving said THROTTLE control symbol to transmit at least one idle state symbol between data messages.

13. (Previously Presented) A digital data system according to claim 12, wherein the THROTTLE control symbol instructs the other of said first and said second nodes receiving said THROTTLE control symbol to transmit a specified number of idle state symbols.

14. (Currently Amended) A digital data system according to claim 13, wherein the THROTTLE control symbol includes an override code to instruct the other of said first and said second nodes receiving said THROTTLE control symbol to stop sending idle stats symbols to cause ~~resume~~ message transmission to resume.

15. (Original) A digital data system according to claim 11, wherein said at least one node is configured to transmit the THROTTLE control symbol responsive to buffer state and thereby reduce incoming data rate.

16. (Currently Amended) A digital data system comprising

a plurality of nodes interconnected by at least one link,

the nodes being configured to communicate message packets on the link between a first node on the link and a second node on the link, each message packet having a format and including a plurality of symbols, wherein the message packet is aligned in relation to word boundaries,

adjacent nodes ~~ones~~ of said first and second nodes being configured to communicate an IDLE state control symbol effective when transmitted by a transmitting node to reduce rate of data flow in said link to a receiving node while maintaining communication between the receiving node and the transmitting node,

the IDLE state control symbol being interposed between symbols of the message packet, and

wherein, on receipt of the IDLE state control symbol, the second node implements a control action designated by the control symbol, and suspends its message symbol byte count until further message packets are received.

17. (Previously Presented) The digital data system of claim 16, wherein the transmitting node transmits data from an output section, and transmits the IDLE state control symbol so as to lower its data output rate to match a rate at which data is available to said output section.

18. (Original) The digital data system of claim 16, wherein the transmitting node transmits the IDLE state control symbol interposed within a message packet to implement a link level flow control of message data to an adjacent node receiving the message packet.

19. (Previously Presented) The digital data system of claim 16, wherein the transmitting node transmits the IDLE state control symbol in response to a control symbol received from an adjacent receiving node.

20. (Canceled)

21-23. (Canceled)

24. (Previously Presented) A digital data system according to claim 9, wherein at least one node includes at least one of

(i) an input buffer that at least temporarily stores a received message, and

(ii) an output buffer that at least temporarily stores a message for transmission,

and the control symbol effects a link level control to prevent buffer overflow.

25. (Previously Presented) A digital data system according to claim 9, wherein a message includes an error code for detecting corruption of a received message, and a receiving node that receives two portions of a message packet surrounding a control symbol realigns the received portions to apply the error code to the two portions of the message packet surrounding the control symbol.

26. (Previously Presented) A digital data system according to claim 9, wherein the control symbol instructs a receiving node to reduce its message transmission rate.

27. (Previously Presented) A digital data system according to claim 9, wherein the control symbol includes a control code for identifying one of

i) a faulty message transmission, and

ii) a faulty message reception.

28. (Previously Presented) A digital data system according to claim 9, wherein the link is bi-directional, and interconnects the first node at one end of the link with the second node at another end of the link, said first and second nodes being full duplex nodes.

29. (Previously Presented) A digital data system according to claim 25, where in the control symbol instructs the adjacent node to reduce its message transmission rate by transmitting a specified number of idle states so as to match receiver capacity to transmission rate.

30. (Previously Presented) A digital data system according to claim 9, comprising a plurality of links forming an interconnect fabric among plural devices, the links interconnecting, and wherein each link has one node attached to one end of the link and another node

attached to another end of the link, the nodes cooperating to route messages along interconnected links between the devices of the system.

31. (New) A digital data system comprising

a plurality of nodes interconnected by at least one link,

the nodes being configured to communicate message packets on the link, each message packet having a format and a plurality of symbols that are transmitted by a first node on the link and received by a second node on the link, wherein the message packet is aligned in relation to a frame signal,

at least one of said first and said second nodes being configured to communicate a link level control symbol,

the link level control symbol being interposed between symbols of a message packet as an additional symbol to signal an adjacent node on the link,

such that the adjacent node receives the additional symbol before completion of the message packet to effect a link level control of message flow on the link

wherein a message includes an error code for detecting corruption of a received message, and a receiving node that receives two portions of a message packet surrounding a control symbol realigns the received portions to apply the error code to the two portions of the message packet surrounding the control symbol.

32. (New) A digital data system comprising

a plurality of nodes interconnected by at least one link,

the nodes being configured to communicate message packets on the link between a first node on the link and a second node on the link, each message packet having a format and including a plurality of symbols, wherein the message packet is aligned in relation to a frame signal,

at least one of said first and said second nodes being configured to transmit a link level THROTTLE control symbol to the other of said first and said second nodes,

the link level THROTTLE control symbol being interposed between symbols of the message packet,

the link level THROTTLE control symbol being effective to induce the other of said first and said second nodes receiving said THROTTLE control symbol to

i) control message transmission of the other of said first and said second nodes receiving said THROTTLE control symbol

ii) controlling said transmission to space out transmission of data messages to regulate flow in said link between the other of said first and said second nodes receiving said THROTTLE control symbol and ~~the~~ one of said first and said second nodes transmitting said THROTTLE control symbol.

such that the other of said first and second nodes receives the THROTTLE control symbol before completion of the message packet to effect a link level control of message flow on the link

wherein said THROTTLE control symbol is asserted with a marker whereby the other of said first and second nodes detects the THROTTLE control symbol within the message packet to effect said link level control of message flow

wherein a node transmits the interposed THROTTLE control symbol in alignment with a symbol boundary in a message packet, whereby received data may be passed through a register of fixed size and the control symbol is discerned via the marker, permitting alignment of portions of a message packet irrespective of interposition of the THROTTLE control symbol therebetween.

33. (New) A digital data system according to claim 32, wherein the THROTTLE control symbol instructs the other of said first and said second nodes receiving said THROTTLE control symbol to transmit at least one idle state symbol between data messages.

34. (New) A digital data system according to claim 33, wherein the THROTTLE control symbol instructs the other of said first and said second nodes receiving said THROTTLE control symbol to transmit a specified number of idle state symbols.

35. (New) A digital data system according to claim 34, wherein the THROTTLE control symbol includes an override code to instruct the other of said first and said second nodes receiving said THROTTLE control symbol to stop sending idle stats symbols to cause message transmission to resume.

36. (New) A digital data system according to claim 32, wherein said at least one node is configured to transmit the THROTTLE control symbol responsive to buffer state and thereby reduce incoming data rate.

37. (New) A digital data system comprising

a plurality of nodes interconnected by at least one link,

the nodes being configured to communicate message packets on the link between a first node on the link and a second node on the link, each message packet having a format and including a plurality of symbols, wherein the message packet is aligned in relation to word boundaries,

adjacent nodes of said first and second nodes being configured to communicate an IDLE state control symbol effective when transmitted by a transmitting node to reduce rate of data flow in said link to a receiving node while maintaining communication between the receiving node and the transmitting node,

the IDLE state control symbol being interposed between symbols of the message packet, and

wherein, on receipt of the IDLE state control symbol, the second node implements a control action designated by the control symbol, and suspends its message symbol byte count until further message packets are received

such that the adjacent node receives the IDLE state control symbol before completion of the message packet to effect a link level control of message flow on the link

wherein said IDLE state control symbol is asserted with a marker whereby the adjacent node detects the IDLE state control symbol within the message packet to effect said link level control of message flow

wherein a node transmits the interposed IDLE state control symbol in alignment with a symbol boundary in a message packet, whereby received data may be passed through a register of fixed size and the control symbol is discerned via the marker, permitting alignment of portions of a message packet irrespective of interposition of the IDLE state control symbol therebetween.

38. (New) The digital data system of claim 37, wherein the transmitting node transmits data from an output section, and transmits the IDLE state control symbol so as to lower its data output rate to match a rate at which data is available to said output section.

39. (New) The digital data system of claim 37, wherein the transmitting node transmits the IDLE state control symbol interposed within a message packet to implement a link level flow control of message data to an adjacent node receiving the message packet.

40. (New) The digital data system of claim 37, wherein the transmitting node transmits the IDLE state control symbol in response to a control symbol received from an adjacent receiving node.

41. (New) The digital data system of claim 37, wherein the control symbol received from a receiving node is a control symbol embedded in a message packet sent by an adjacent receiving node.